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ANCIENT ROCK INSCRIPTIONS IN EASTERN
DAKOTA.

BY T. H. LEWIS.

ON the celebrated map of I. N. Nicollet, of the "Hydrographical basin of the Upper Mississippi river," published by the U. S. Government in 1845, appear, for the first time, two strange names in Eastern Dakota, not far from the sources of the Minnesota river. The first is *Wakiyan Hurpi* (or thunder's—*not* lightning's—nest), placed about thirteen miles north-west of the foot of Lake Travers; and the other is *Wakiyan Oye*, a few miles west of the head of the same lake. The route followed by Nicollet, however, did not pass by either place, so he must have put them down from the general description of his guides, as he makes no mention of them in his text. It is of the latter locality, well known by its translated equivalent of "Thunder Bird's Track"—on account of the incised rocks there—that this article treats; together with another rock of like kind in the neighborhood.

In the month of August, 1883, I was engaged in the survey of the sepulchral tumuli, forts and other earth-works of Big Stone and Travers lakes, and thus being brought into the vicinity of the rocks in question, took the opportunity afforded of making careful tracings of the pictographs they showed, considering them of much archæological interest. These tracings have been reduced by pantograph to one-eighth the size of the originals, and drawings thus made from them accompany this short account of the "track rocks."

The first diagram shows the pictographs constituting "Thunder Bird's Track," as they are engraved on an irregular shaped rock located some six miles west and a little north of the village of Brown's Valley, Minnesota, and within the limits of the Sisseton and Wahpeton reservation of Dakota Territory. The rock lies on the summit of a hill which commands a good view of the country, though there are other hills in the vicinity which have a greater altitude. It is about three and a half feet in diameter, and the characters are grooved in its surface to about one-fourth of an inch in depth. The grooves are, for the most part, very smooth. It will be seen, however, that these figures do not make very good bird-tracks, and I think that they more probably rep-

resent human hands. For convenience of reference the separate characters are numbered on the diagram, and may be thus described,

1 and 2. Represent hands placed in different positions.

3. Shows two hands in combination.

4. Is of a nondescript shape.

5 and 6. Are undoubtedly meant for hands, as their outlines can be imitated in shadow on the wall by placing one's own hands in the proper positions.

7. Is another nondescript, though a portion of it represents a hand.

The other rock is known as "Thunder Bird's Track's Brother"—that is, a brother to the "track"—and is situated about two miles east of his elder, on the slope of a terrace bordering the valley of the Minnesota river. As will be seen on comparison, the diagrams illustrating the two rocks are entirely distinct from each other in respect to the shapes of the characters, and by no means bear out the close relationship between the localities implied by the names the Indians have given them.

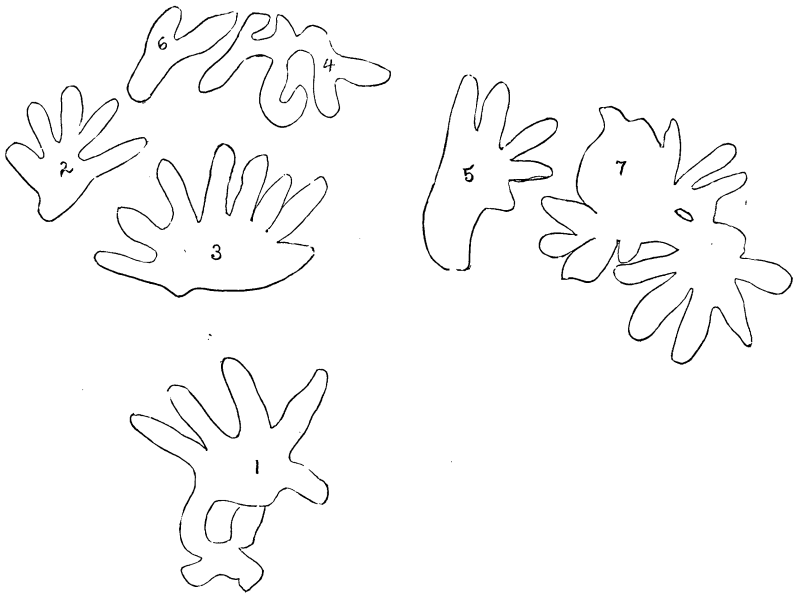
The inscriptions on both rocks are apparently very ancient, and it is extremely doubtful whether the present Indians or their immediate predecessors (the Cheyennes?) had anything to do with carving them.

I made inquiry as to any traditions that might be current among the Dakota Indians on the reserve concerning these rocks, and obtained certain mythological information now concisely stated.

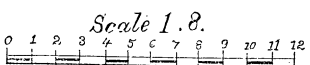
Thunder Bird is said to have had his nest on a high mound, which was composed of sticks and brush, and was situated some ten miles north-west of the foot of Lake Travers, in the center of a deep wide gorge. One day there was a great storm which flooded the whole country. Thunder Bird, in his anger at having been driven from his nest by the rising waters, flew away and alighted on this rock—*Wakiyan Oye*—which was the only place not covered by water, and left the impression of his feet there.

On subsequently looking for printed records of this tradition, the first account I could find of it was in the shape of a short poem from the pen of an Indian trader of 1823, W. J. Snelling (son of the military officer after whom Fort Snelling was named),

Thunder Bird's Tracks.



Thunder Bird's Tracks' Brother.



which appeared in Griswold's *Poets and Poetry of America* (1842), and has been reprinted in Mr. Neill's histories. The last stanza but one has direct reference to the rock I have here first described, and runs thus :

“ Not long upon this mountain height
The first and worst of storms abode,
For, moving in his fearful might,
Abroad the God-begotten strode.
Afär, on yonder faint blue mound,
In the horizon's utmost bound,
At the first stride his foot he set ;
The jarring world confessed the shock.
Stranger ! the-track of Thunder yet
Remains upon the living rock.”

—:O:—

VARIATION OF WATER IN TREES AND SHRUBS.

BY D. P. PENHALLOW.

THE amount of water which highly lignified plants contain, particularly as influenced by season and condition of growth, obviously bears a more or less important relation to physiological processes incident to growth, and most conspicuously to those which embrace the movement of sap. Studies relating to the mechanical movement of sap in early spring at once suggest the question as to how far this is correlated to greater hydration of the tissues at the time when this movement is strongest. It was with a view to exhibiting this relation more clearly, that determinations of moisture in a large number of woods, representing growth of one and also of ten years, collected at different seasons, were made in 1874.¹ The range of seasons was not as complete as could have been desired, and no attempt was made to formulate a general law applicable to this question. With a view to extension of data in this direction, additional estimates were undertaken in 1882, and it is the object of the present paper to combine all the results thus obtained, together with such other facts

¹ W. S. Clark. *Agriculture of Massachusetts*, p. 289.